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PUBLIC HEALTH IN WARTIME
GRANT FLEMING

•

EQUINE ENCEPHALOMYELITIS IN HUMANS
A. C. McGUGAN

•

NUTRITION AND CHILD HEALTH
E. W. McHENRY

•

TYPHOID FEVER DUE TO RAW MILK
J. SARTO SIROIS

•

DIAGNOSIS OF ENTEROBIASIS
E. KUITUNEN-EKBAUM

•

ANALYSIS OF TETANUS TOXOID-ANTITOXIN FLOCCULES
P. J. MOLONEY AND JOAN N. HENNESSY

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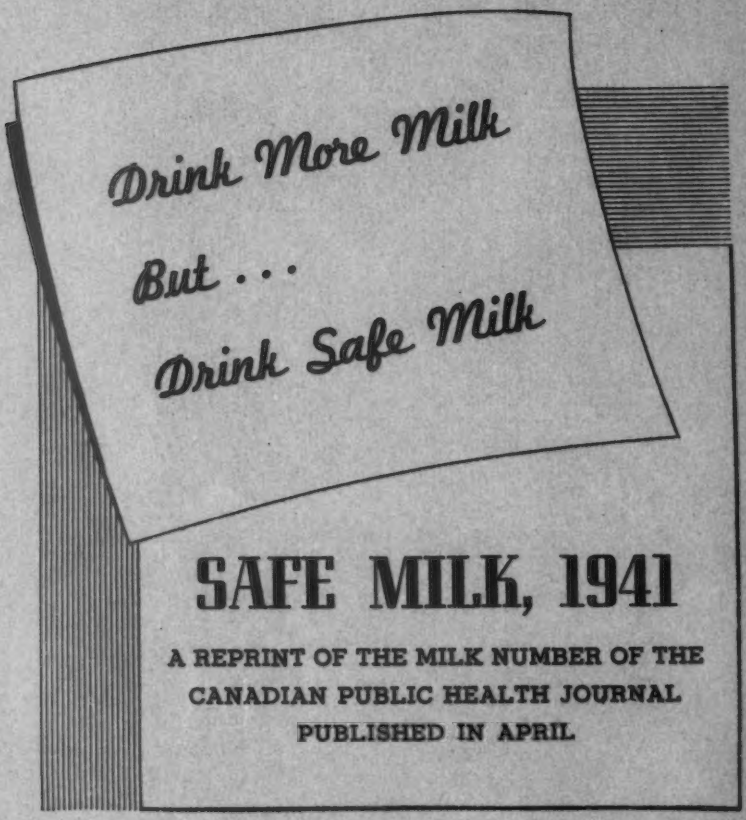

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CANADIAN PUBLIC HEALTH ASSOCIATION

CANADIAN
PUBLIC HEALTH JOURNAL

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Public Health in Wartime*

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CANADA is at war. Individually and collectively, we are pledged to devote our energies and resources to the winning of this conflict so that we may be able to organize a way of life that will ensure spiritual, intellectual, and physical freedom and security.

It is the obvious duty of the Canadian Public Health Association, as the national public health organization, to appraise the present public health situation in order to learn how public health may contribute to the winning of the war through the conservation and increased effectiveness of Canadian man power.

During a war period, the population falls naturally into two main divisions: those who serve in the armed forces, and those who remain in civil life. Not more than ten per cent of the population will be in uniform, which means that ninety per cent will continue as civilians. The two divisions of the population may be considered separately, but, in a practical sense, from a public health point of view, they remain interrelated and interdependent. It is from the civil population that the armed forces draw their recruits. Disease does not respect His Majesty's uniform. The spread of disease from one group to another is something of which we are all aware.

In this war, the armed forces are more dependent than in any previous war upon the capacity of industry to meet the demands for mass production of the implements of mechanized warfare. The capacity of industry to produce war supplies while maintaining essential civil services depends, in very large measure, upon the physical and mental health of the industrial workers.

Despite what has been said to the contrary, I believe that the people

*Presented at the thirtieth annual meeting of the Canadian Public Health Association, held in the City of Quebec June 9–11, 1941.

of Canada are fully alive to the seriousness of the situation. What they are asking for is leadership—leadership in all fields, including public health, is what they want. Should not the Canadian Public Health Association, as a national organization, assume such leadership and tell the people of Canada what action is required to maintain and improve the man-power of the country as a means to the end of strengthening our war effort?

It would be a waste of time to express regret over what has not been done, and to do so would not be constructive in its results. To whatever extent the present situation is unsatisfactory, it reflects our own failures, as public health workers, to have our ideas and ideals of public health accepted by those who are now in authority. For example, it is a sad reflection upon us that we accomplished practically nothing, during the inter-war period, to improve housing for the lower-income group. Obviously, too, we did not convince our medical leaders of the value of health services in the modern sense, for if we had, all branches of our armed forces would have well-organized health services, and neurology would not be confused with preventive psychiatry.

But, as I have suggested, let us not waste time in vain regrets; rather, let us plan for the present and for the future.

The situation, as I see it, presents us with two problems: the one, immediate and urgent, growing out of the war situation; the other, the future of the nation after the war.

The first step which I consider should be taken is a war measure. In times of peace, public health workers have accepted that the best and surest progress is made through public education. In this war, we cannot afford to allow to any individual the right to be sick, nor can we be complacent in the face of community neglect of public health.

I would suggest that, as a war measure, our public health authorities ask for legislation, if it does not exist, and for its literal enforcement, if it does exist, to require pasteurization of all community milk supplies, the chlorination or other satisfactory means of safeguarding all community water supplies, and smallpox vaccination and diphtheria immunization of all children. It is nothing short of ridiculous for health departments to be using up their time and energy in promoting such well-established disease-prevention procedures as these. Their efforts should be fully directed towards other problems which, unfortunately, cannot be so easily solved. I am satisfied that if the people of Canada understood that the subjects to which I have referred are related to our war effort, they would insist upon action and that without delay.

There is immediate and urgent need for an intensive adult health program. It is the health of the present adult population which will determine our capacity to produce in quantity and in quality. True, money is required, but of infinitely greater importance are healthy workers, for, without them, money is of no avail in speeding production. The simplest way to reach a large percentage of adult workers is through industry. Industrial health services should include health conservation, physical and mental, in addition

to disease and accident prevention. It is not merely a question of reducing lost time due to illness or accidents, important as that is; what is needed is to raise health standards so as to reach a maximum in production of the best quality. When public health departments give leadership, and when they, working with and through industry, achieve the establishment of industrial health services comparable to the best of school health services, then we will be on the way to achieve results in the field of adult health.

I would suggest that it is through industry that intensive drives should be made against the major communicable disease hazards of tuberculosis and syphilis.

Unless we are to accept the implication that government policy is determined by the responsibility for pensions, there is no more reason for government expenditure on X-rays of military recruits than there would be for extending such case-finding methods to the industrial population.

Another urgent and immediate public health need, as I see it, has to do with nutrition. In the interval between wars, we have learned much about nutrition, and a great deal has been done to popularize this knowledge. Unfortunately, it is a field which lends itself to quackery and the exploitation of unprincipled commercial enterprise. In nutrition, as in everything else, results come only from the application of knowledge, and I believe that every health department should be enlisting the housewives of its area to make a contribution to the war effort through the proper feeding of their families—adults as well as children.

Turning to the future of the nation after the war, I believe we can accept that our responsibility is to prepare the child of today to be a good citizen and a competent parent. This implies a well-developed mind and body. It is then the duty of public health to continue and expand existing services for the physical and mental welfare of the child. Particularly is the public health authority challenged to develop adequate mental health services which, up to the present, have received relatively little attention.

Most public health workers have recognized that the provision of adequate medical care for all persons, irrespective of ability to pay for such services, on a fee basis, when required, is essential to the maintenance of satisfactory health conditions in any area. Without entering into a discussion of the controversial subject of health insurance, I would like to point out that, in all likelihood, both during the war period and after, the situation with regard to inadequacies in medical care services will almost certainly become aggravated. Furthermore, it is to be expected that governments will turn for advice to their health departments if it is decided to provide medical care in any organized way. It therefore seems to me that public health should be prepared, in advance, with sound practical plans for the provision of medical care, adjusted to geographical areas or population groups.

To sum up, let me say that public health in wartime should be radical in law enforcement, active in the promotion of adult health, insistent in its services for children, and far-sighted in its plans for organized medical care.

Equine Encephalomyelitis (Western Type) in Humans in Alberta, 1941

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DURING the summer and fall months of 1941 a number of cases of encephalomyelitis among humans were reported in Alberta. During the same period there was an extensive outbreak of encephalomyelitis in humans in Manitoba and Saskatchewan. In 1941 the incidence of equine encephalomyelitis (Western type) among horses in Alberta was very high. Admittedly the series of cases presented in this article is small and the information not as complete as one would wish.

Diagnosis and Reporting

Concurrent with this outbreak of encephalomyelitis there was an epidemic of poliomyelitis in Alberta. Also there were a number of sporadic cases of a severe type of dysentery which conformed to the clinical and pathological picture of acute ileo-colitis. From some of these latter cases Flexner (W) bacilli were recovered from autopsy specimens of the bowel wall. Several physicians have expressed the opinion that cases seen by them early in the summer probably were encephalomyelitis but at that time they were not recognized as such. Several others have stated that cases reported as poliomyelitis probably were encephalomyelitis. Three cases which terminated fatally in a few hours presented a clinical picture very reminiscent of that found in acute ileo-colitis.

Forty-two cases were reported to the Provincial Department of Health as encephalomyelitis by local boards of health. Blood specimens from twenty-eight of these cases were received for serological and immunological investigation. Nineteen of these specimens were reported positive for the virus of equine encephalomyelitis (Western type). One specimen was reported as a doubtful positive and eight were reported as negative. Of the eight negative specimens three were from patients with a clinical history suggestive of acute ileo-colitis. One was from a case which, at autopsy, proved to be "an infiltrating neoplasm extending through the corpus collosum into both frontal lobes".

Blood samples were also submitted from eighteen patients who had not been reported to the Department of Health as encephalomyelitis cases or suspects. Of these, eight were reported as positive for the virus of equine encephalomyelitis (Western type). Two specimens were reported as doubtful positives and eight were reported as negative. Enquiry forms were forwarded from the

Provincial Department of Health to the physicians who had reported the above-noted forty-two cases. Case histories were received on twenty-three cases. It is on these histories and our routine report forms that the following observations have been based.

Geographic Distribution

Seventy-five per cent of all reported cases occurred in that part of the province south of the main line of the Canadian Pacific Railway and east of highway number two. Most of the irrigated part of the province is in this area.

Seasonal Incidence

The first established case of encephalomyelitis was reported as a typhoid fever case in late July. The incidence peak occurred between the middle and the end of August. In Alberta spring and summer weather arrived about three weeks earlier than usual. The summer was very dry except in the Peace River area and September was unusually wet and frosty. Flies and mosquitoes were reported as unusually "bad" in the irrigation areas above-noted. The onset of the last reported case was on the tenth of September.

Occupation

Slightly over ninety per cent of all reported cases occurred among farmers and members of farmers' families.

Age and Sex

The distribution of the cases according to age is given in table I.

TABLE I

ENCEPHALOMYELITIS IN ALBERTA, 1941
DISTRIBUTION ACCORDING TO AGE

Age Group	Cases	% of Total	Age Group	Cases	% of Total
0—1	0	0	35—44	3	7.1
1—4	3	7.1	45—54	4	9.4
5—14	6	14.2	55—64	5	12.0
15—24	11	26.2	65 & over	3	7.2
25—34	5	12.0	Unstated	2	4.8

The youngest reported case was a child of three years and the oldest a man of seventy-four. Thirty of the reported cases were males and twelve were females.

History of Contact

Ten patients gave a history of having attended horses that had encephalomyelitis. One patient buried a horse which had died of encephalomyelitis. The patient died three days later. Two patients stated that they had been bitten by "an ugly black fly". Each insisted that the fly was not the common horse-fly.

Clinical Course

In the cases reported a physician was called either on the first or second day of illness in all except three cases. Severe occipital headache was an almost invariable complaint. Temperatures were elevated to from 103° to 105° F. at the onset. The pulse rate was relatively slow (80-120). Vomiting was reported in 70 per cent of all cases. Diarrhœa was not common. This complaint was noted in the three children in the age group 1-4 years. Diplopia was noted in one case only. Mental confusion, irritability and somnolence were reported in every case. Convulsions were rare. Thirty per cent of all cases were delirious and about half of the cases became comatose. Tremors of the facial muscles occurred in 40 per cent of all cases. Complaint of pain in the back of the neck and along the spine was invariable. In seventy per cent of all cases both deep and superficial reflexes were reported as being exaggerated in the early stages of the infection and diminished in the later stages. Fifty per cent of the cases evidenced some degree of paralysis. The facial muscles were involved in only three cases. The muscles of the arms and legs were involved in four cases. Paralysis of the bowels and bladder was reported in three cases.

Blood counts evidenced a relative leucopœnia.

Spinal punctures had been done on ninety per cent of all reported cases. The spinal fluid was invariably under pressure. Globulin was increased. Cell counts were usually around 200. Lymphocytes predominated.

The following case summary is given as one of the most complete and typical of those reported:

M.S. Admitted August 23, 1941. Discharged September 3, 1941. Temperature 104.2 Pulse 86. Respirations 20.

On admission signs and symptoms were: general malaise, chilliness, mental confusion, vertigo, nausea and vomiting, irritability, somnolence and delirium, nuchal pain and shooting pains in the ankles.

Physical findings: Neck rigidity, no nystagmus, absent abdominal reflexes, hyperactive patellar reflexes.

He was given heavy doses of sulphonilamide. The temperature dropped from 104.2 on admission to 98.4 on August 26th. For about a week he remained disoriented and irrational. Following this he began to clear mentally. He had to be catheterized and bowel movements were difficult. At the present time (September 19) his speech is slower and high-pitched. He has tremors of the facial muscles and also muscular incoordination of the extremities. He gets into a difficult position and cannot get out of it without help.

He gives no history of having been in contact with sick horses or with other cases. He remembers that a few days previous to becoming ill "an ugly black fly" bit him on the wrist. He says that his arm felt numb after the bite.

Sequelae

Of the twenty-three cases on which case histories were returned ten made

apparently uneventful recoveries. Three other cases evidence personality and behaviour changes—slowing of mental processes, loss of memory, carelessness regarding personal hygiene, etc. Three of the cases still evidence physical changes—spastic gait, continued headache, loss of weight, and speech difficulties. Of the cases on which histories have been returned, six died. On one, whose blood was serologically and immunologically negative, the autopsy examination revealed an "infiltrating neoplasm extending through the corpus collosum into both frontal lobes." All three children in the 1-4 age group died. Blood specimens from two of these patients were negative and no specimen was obtained from the third. These children died in from two to six days after the onset of their illnesses and the clinical description of their illnesses is very reminiscent of acute ileo-colitis. One reported case, whose serology was negative, has residual paralysis in the right deltoid. This case appears to have been a case of poliomyelitis.

Diagnosis

The diseases which have presented differential difficulties in this epidemic were, as has been indicated, typhoid fever, acute anterior poliomyelitis, acute ileo-colitis, and influenza.

Summary

During the summer and early fall of 1941 an epidemic of equine encephalomyelitis (Western type) occurred among horses and humans in Alberta. Forty-two cases were reported among humans. Blood specimens from twenty-eight of these forty-two reported cases were received. Of these specimens twenty were positive and eight were negative. Blood samples were received from eighteen cases not reported as encephalomyelitis. Of these, eight specimens were reported as positive for the virus of equine encephalomyelitis (Western type). Eight deaths were reported in humans from encephalomyelitis. One of these deaths was due to an intra-cranial malignancy and three appeared to have been due to acute ileo-colitis.

Acknowledgment

The writer wishes to express his thanks to Dr. Ronald Gwatkin, Director, Dominion Agricultural Laboratory, Kipp, Alberta, for his kind co-operation in doing all the serological and immunological tests to which references have been made herein; and to those physicians who have co-operated in presenting clinical histories of cases.

Nutrition and Child Health*

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THERE has been for several years a growing interest in the subject of nutrition and during the past few months this interest has expanded very rapidly. Several obvious results are in evidence in Canada. The Dominion Department of Pensions and National Health has created a Division of Nutrition with a staff of five persons. Each province is setting up a nutrition committee. Ontario has already done so, and the Ontario committee, under the chairmanship of Dr. John T. Phair, has held several useful meetings and is drafting a province-wide program to improve the state of nutrition of the people of this province.

My special task, today, is to discuss the part the educational system can, and should play, in a nutrition program. I propose to consider the reason for the current interest in nutrition, the evidence which is available regarding the nutritional status of people in Ontario, and the steps which must be taken to improve nutrition, pointing out in this connection the role the schools can undertake.

During the past thirty years there has been a great deal of scientific research in nutrition. This research has produced a great deal of valuable information. I shall summarize it briefly:

1. We now know that a number of definite diseases are caused by faulty diets. None of these diseases are new; most have existed for several centuries, at least. What is new about them is that the cause is now known and, with clear-cut information about the cause, has come the means of prevention. Deficiency diseases, which formerly were scourges and are still serious problems in some parts of the world, can now be prevented, if people will use proper foods and if these are made available. Pellagra, a disease which has been one of the main causes of death in the southern United States, and beri beri, a disease in which paralysis is present and which has been common in the Orient, are two examples of results of nutritional deficiencies.

2. Research in nutrition has also shown the details of a diet which is adequate for health. This will be discussed in detail presently.

3. It is now recognized that there is an in-between state of nutrition—a consumption of foods sufficiently good to prevent severe disease but not optimal. In this intermediate state there is a lowering of resistance to infection, a decreased vitality and ability to do work. An example will convey the meaning more clearly. Two years ago at the Mayo Clinic a group of volunteer subjects were given day after day for several months a diet which contained about half the amount of vitamin B_1 needed for a full measure of health. They received enough of the vitamin to prevent real disease but they soon lost appetite and developed a lassitude and unwillingness to work. Moreover they showed a state of mental depression.

**An address given before the Health Section, Ontario Educational Association, Toronto, April 8, 1942.*

It is clearly known today that an intermediate state of nutrition lowers the level of health. It decreases the rate of growth of children. It increases maternal and infant mortality. It interferes with a person's ability to work. The important feature of this knowledge for us is that evidence is now available to show that a great many people in Canada are living, nutritionally, in this in-between state.

I have pointed out that a clear statement can be made as to what should be eaten for a full measure of health. This information can be given in two ways, and both will be employed. First, in scientific terms, or what might be called the scientific principles of proper food supplies:—

1. The total amount of food must be sufficient to furnish the energy we need each day: energy produced in the body to keep us warm, to enable us to live, and to enable us to exercise and work. The energy requirement of normal individuals will be met if enough food is eaten to just satisfy the appetite.

2. The diet must supply material for tissue formation and repair. The chief material required is protein, obtained from many foods, but chiefly from meat, eggs, milk and cheese.

3. A number of so-called mineral elements are needed. Attention is generally given to four: calcium and phosphorus required for the building and maintenance of bones and teeth, iron for the manufacture of the red blood pigment, and iodine for the functioning of the thyroid gland.

4. A series of vitamins are required for the prevention of disease. Nine different vitamins are now listed as essential for man.

The information can be given, more practically, in terms of actual foods. In translating our scientific information into the choice of foods a simple rule should be stressed. Primary attention should be given to obtaining those foods which supply minerals and vitamins. Unless this is done there is real danger that the diet will be deficient. Foods which are excellent sources of minerals and vitamins are called "protective"; the name is suggestive. It is used because these foods protect health. The common protective foods are: milk, whole grain cereal products, meat, eggs, butter, fruits and vegetables. If we eat adequate amounts of these foods every day we will ensure obtaining the minerals and vitamins which are needed. The appetite can then be satisfied by using almost any other foods we like.

You will have noted that these protective foods are all common Canadian ones. There have been no shortages of food in this country. Remembering these two statements one would expect that the people of this country would all be well fed. Unfortunately, that is not the case.

Four years ago a Toronto committee investigated the food consumption of a group of low-income working families. The principal results have been reported (1). The fathers were the best fed, young children next, then the older children, and finally the mothers were most poorly fed. The total amount of food, expressed in calories, was not sufficient. The amounts of protein were too low. The fathers had sufficient calcium and iron but no one else in the families did. Children, particularly, need calcium for the proper development of bone. These children received about half the quantity of calcium

they should have had. The explanation is simple: the amount of milk available was about fifty per cent. of the quantity the children needed; it averaged about half a pint per child per day.

In 1939-40 four similar surveys were made, one on a higher income group in Toronto and low-income surveys in Halifax, Edmonton, and Quebec. Preliminary reports have been published (2). The picture in each survey is somewhat the same. The principal deficiencies are calcium, iron, vitamin B_1 and C, or to express it in another way, a shortage of protective foods.

Why should these nutritional deficiencies exist in a land of plenty? There are two main causes of dietary inadequacy in Canada: (1) the inability of people in low-income groups to purchase proper amounts of such protective foods as milk, meat, and eggs; (2) a lack of knowledge about nutrition.

Several examples, arising from these surveys, can be given to show how a lack of knowledge causes malnutrition. One of the most interesting examples, particularly to people interested in education, was furnished by the teen-age girls in the second Toronto survey. Except for vitamin B_1 the diets of the younger children and of the teen-age boys were adequate. The calcium intake of the teen-age girls was low. The calcium requirement is greater in the teens than for children under twelve because of the rate of skeletal growth. The milk consumption of the teen-age girls was low. The reason for this was easy to find; the girls wanted to be thin and they erroneously thought that milk was fattening. The two factors which control body weight are the calorie intake and the energy expenditure. The calorie intake of the girls was greater than that of the boys because they ate pastry, cake and candy generously. Actually they were consuming the most fattening foods and were taking less of foods not nearly so fattening and much more valuable for health. These girls had all been exposed to health teaching in the schools and to household science; they had failed to learn the simple rules to be followed in the choice of foods for health.

An example of a lack of a different type of nutritional information can be provided from the survey on low-income Toronto families. A comparison of the food consumption of two families is of interest. These families contained the same number of persons, of about the same age, and with the same family income. The amounts of money spent for food were nearly the same yet the adequacy of the diet of the second family was much better than for the first family. The difference was readily explained by an examination of the food purchases. The second mother bought food economically and secured more nutritive value. We have seen many illustrations, like this, of the need for training in the economical purchase of foods. Obviously this type of information is particularly needed in low-income families. It should be stressed in household science classes.

A third type of nutritional knowledge is essential and this is about good cooking methods. The nutritive value of food, even if chosen well and purchased economically, can be seriously impaired by poor cooking. This is especially true in the case of vitamin C. At least half of the amount of this vitamin in vegetables can be destroyed by prolonged cooking.

If we wish to prevent malnutrition in Canada we must remove the two principal causes: the financial factor and lack of knowledge. There is not much that most of us can do about the economic factor but we can do a great deal with regard to education. Considerable progress has been made in the past few years in this respect and results are fairly apparent. Nutrition is part of the teaching of health in the curriculum of Ontario schools. It is hardly necessary to point out to you that it is difficult for teachers to provide instruction in a subject unless they are reasonably well trained in the particular subject. This is as true of health or nutrition as it is of arithmetic or grammar. This need has been seen and a considerable improvement has been effected in the training of teachers, particularly in some of the Normal Schools. Nutrition classes for women are being provided in many municipalities and the Women's Institutes are doing excellent work in providing nutritional information for rural families. A great deal of information is available in newspapers, in magazines, and on the radio. All of this is excellent and needs to be extended. The more I consider the problem of nutritional education, the more I am convinced that the best place to provide this is in the schools. Several reasons can be cited. If nutrition classes for adults are held in any community, it is the invariable experience that only part of the community is reached. Even with a long-established and excellent agency like the Women's Institutes, this is still true. Every child must attend school until sixteen years of age; every person in Ontario can receive some training in nutrition during his school life. Food habits are formed in childhood and generally persist throughout life. If good food habits are ingrained into children we will likely have a better nourished population. This may be slow, and some people may feel today as the result of the present wave of interest in nutrition that there should be a brief evangelistic type of campaign for the whole population; I am not deprecating that but I do feel that the results of the slow method will probably be more enduring.

What should be taught about nutrition in schools? Let me first sound a note of warning, especially applicable at present. I have tried to emphasize the relation of nutrition to the maintenance of health. I am most anxious not to leave the impression that nutrition is the only factor which influences health. Many safeguards must be taken to ensure health. A well-fed child can get diphtheria if he is not toxoided; an immunized child can be ill if he is not properly fed. Even an ample supply of the right foods will not protect the health of a child who stays up late at night and does not get his proper rest. Nutrition is best taught, not as a separate subject, but as part of a training in the rules of healthy living. In that way it should be taught to every school child. Emphasis should be placed on the use of healthful foods and can start in the first grade. Later, information as to why certain foods are necessary can be imparted. Nutrition can be, and should be, taught to girls as part of a course in home-making and, in this connection, there should be training in the choice of foods, in economical purchasing, and in cooking.

During the past few months our department has co-operated with Dr. William Mosley, Medical Officer of East York Township, in conducting a health survey in East York Collegiate Institute. Complete results are not yet available.

As in any complete health survey, attention has been given to nutrition. The survey included physical examinations, the taking of medical histories, the securing of records of food consumption and several tests for specific vitamin deficiencies. I have chosen, at random, the dietary records of twenty girls, aged 14 to 16. The average picture for these girls is given in table I. You

TABLE I

DIETARY ADEQUACY OF 20 GIRLS 14-16 YEARS
East York Collegiate, 1941-2

	Average Per Cent Adequacy	*Number Markedly Deficient*
Calories	96	1
Protein	106	0
Calcium	101	0
Iron	99	1
Vitamin A	254	0
Vitamin B_1	78	9
Vitamin B_2	113	1
Vitamin C	65	12

will note that the diet was splendid, except in two respects: vitamins B_1 and C. I would like you to contrast the calcium intakes of these girls with those of the teen-age girls previously mentioned. The girls in East York had plenty of calcium; the reason is that they received an average of a pint of milk per day. Through the efforts of the principal of the school the sale of soft drinks in the school cafeteria was banned over a year ago. Since that time the consumption of milk has doubled. We can see the beneficial result in the records of these girls.

There is another lesson arising from these records. You will note that there were deficiencies of vitamin B_1 and C but the girls had two and one-half times as much vitamin A as they needed. This was partially due to taking cod liver or some other fish liver oil preparation. This was not harmful and should not be criticized. There has been heavy emphasis for some years to encourage people to do so. What is now needed is not a campaign for some particular food or some special vitamin but an effort to help people to obtain a balanced diet, containing all essentials in adequate amounts. All of the Canadian surveys have shown the presence of the same deficiencies in minerals and vitamins. These deficiencies have resulted from a failure to secure protective foods in proper quantities. I would strongly recommend that we put our emphasis upon a simple dietary rule: build the diet upon protective foods like milk, meat, eggs, vegetables, fruits and whole grain cereal products. All are essential. If we teach children and adults to do this we will have removed one of the two principal causes for the occurrence of nutritional deficiencies in Canada.

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Analysis of Tetanus Toxoid-Antitoxin Floccules*

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Connaught Laboratories, University of Toronto

FROM experimental data obtained by the analysis of diphtheria toxin-antitoxin floccules, Pappenheimer and Robinson (1937) calculated the nitrogen content per unit of both toxin and antitoxin. The calculated values depended on three assumptions: viz. (1) that within a certain range of flocculation the toxin and antitoxin were completely precipitated; (2) that the floccules contained only toxin and antitoxin; (3) that there was no significant loss of floccules due to washing with chilled saline.

Evidence substantiating the first of these assumptions had been advanced by Healey and Pinfield (1935). Regarding the second assumption Marrack and Smith (1930) had shown that, most probably, non-specific protein is not carried down with the floccules. Moreover, Pappenheimer and Robinson (1937) brought forth additional evidence which tended to confirm the correctness of both these assumptions. On the other hand, Pope and Healey (1939) have stated that with ordinary antitoxin, in contrast to antitoxin altered by peptic digestion, there may be quite incomplete precipitation and that in some instances there may be an appreciable loss of floccules during washing with saline.

In the present note we are presenting some results of an analysis of tetanus toxoid-antitoxin floccules. In this work we followed in general the procedure which Pappenheimer and Robinson had used with diphtheria toxin-antitoxin floccules.

EXPERIMENTAL

Three toxoids and three antitoxins were used. Toxoids nos. 160 and 170 were prepared from Martin's medium; toxoid no. 644 was prepared from medium containing Neopeptone. Before flocculating with antitoxin the toxoids were purified and concentrated by precipitation with ammonium sulphate and with acid.

Tetanus antitoxin A_1 had been purified by a peptic digest method. In addition to tetanus antitoxin it contained an antibody which gave rise to a second zone of precipitation with certain toxins and toxoids. Antitoxin A_2 was obtained by absorbing antitoxin A_1 with floccules of the second flocculating zone. As a result it contained markedly less non-antitoxic precipitating antibody. Antitoxin B had also been purified by a peptic digest method. It was further purified by flocculating with tetanus toxin and extracting antitoxin from the floccules after the method of Pope and Healey (1939).

For each flocculation the amount of toxoid was kept constant and the

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amount of antitoxin varied. Tubes containing mixtures of toxoid and antitoxin were placed in a water bath at 46° C. for three hours, and left in the cold room overnight. The tubes were then centrifuged, the supernatants poured off, and the floccules washed three times with chilled saline. For the purpose of Micro-Kjeldahl determinations each mixture was set up at least in triplicate.

The first supernatants from the flocculated tubes were tested for the presence of antitoxin or of toxoid. Antitoxin was tested for by the mouse method. For measuring small amounts of toxoid the method consisted of mixing varying dilutions of the supernatant with a constant amount of antitoxin (0.02 u/cc.) and after the mixtures had stood for half an hour at room temperature, the residual antitoxin was determined by the mouse method.

In addition to testing the supernatants for excess toxoid or antitoxin, determinations were carried out on the absorbing power for toxin and for antitoxin of washed floccules.

The results are summarized in tables I and II.

The calculated values of nitrogen per unit antitoxin as shown in table I

TABLE I

NITROGEN CONTENT OF FLOCCULES

Antitoxin	Units (American)	Toxoid	Lf's Toxoid	Mgm. N in Floccules	Mgm. N per unit Antitoxin
A_1	1500 650	160	970	1.265 0.996	0.00030
A_1	1680 600	644	1000	1.499 0.748	0.00070
A_2	1700 700	644	1000	1.348 0.855	0.00050
B	1015 580	170	800	0.750 0.530	0.00050

are not in good agreement. There are a number of reasons which might account for this lack of agreement in results:

(*a*) Both toxoid and antitoxin were present in the supernatants after flocculation as shown in table II. The amounts of these, however, are not

TABLE II

TOXOID AND ANTITOXIN IN SUPERNATANTS AND ABSORBING POWER OF FLOCCULES

Antitoxin	Units (American)	Toxoid	Lf's	Supernatants	Absorption by Floccules
A_1	1500 650	160	970	2.25[a] Ant. 1.35[a] Toxoid	360[a] Toxin 360[a] Antitoxin
A_1	1680 600	644	1000	2.5[a] Ant. 2.25[a] Toxoid	300[a] Toxin 450[a] Antitoxin
A_2	1700 700	644	1000	<0.75[a] Ant. 2.5[a] Toxoid	485[a] Toxin 310[a] Antitoxin
B	1015 580	170	800	4.25[a] Ant. 21.0[a] Toxoid	....

sufficiently large to change in any marked degree the nitrogen values of the floccules. The largest amount is with the mixture of antitoxin B and excess toxoid. In this instance there is indicated incomplete precipitation of floccules in the order of 10 per cent.

Concerning the question of toxoid and antitoxin in the supernatants after flocculation it is of interest to consider the results shown in table II of absorption of toxin and antitoxin by floccules. The floccules which were used were prepared in the same way as those used for nitrogen determinations. Floccules from mixtures containing excess antitoxin were mixed with known amounts of toxin, and those from mixtures containing excess toxoid were mixed with known amounts of antitoxin. After the suspensions had stood at room temperature for one hour, they were centrifuged and the amounts of toxin or antitoxin left in the supernatants were determined. The difference between the amounts of toxin or antitoxin originally added to the floccules and those found in the supernatants is recorded in table II under "Absorption by Floccules." The values for antitoxin absorbed by floccules made from mixtures which contained excess toxoid agree very well with the differences between the number of Lf's of toxoid and the number of units of antitoxin contained in the mixtures. This result tends to confirm the evidence regarding completeness of precipitation given in table II under "Supernatants." On the other hand, the floccules made from mixtures which contained excess antitoxin, absorbed only in the order of one half the amount of toxin corresponding to the differences between the units of antitoxin and of toxoid in the mixtures. This latter result might be taken to indicate a rather marked incompleteness of precipitation of floccules. This, however, is unlikely as indicated by the small amounts of antitoxin remaining in the supernatants after flocculation.

(*b*) In order to investigate the possibility of loss in floccules due to washing, nitrogen determinations were carried out on the third washings of floccules from mixtures containing antitoxin A_2 and antitoxin B. For floccules prepared from antitoxin B there was no indication of loss due to washing. In the case of antitoxin A_2 the loss in floccules as calculated from the nitrogen content of the third washings was in the order of 10 per cent for both mixtures with excess antitoxin and with excess toxoid.

(*c*) There is the possibility that in some instances the floccules have contained, besides toxoid and antitoxin, other specific antigen-antibody. Mixtures of tetanus toxoid (or toxin) and antitoxic serum often exhibit more than one zone of flocculation, and obviously if a non-toxoid-antitoxin zone of flocculation overlaps the true toxoid-antitoxin zone, the results of floccule analysis will be in error. This possibility of overlapping zones of flocculation could explain the difference in results shown in table I for floccules from toxoids 644 and 160 and antitoxin A_1 on the one hand, and for floccules from toxoid 160 and antitoxin A_2 on the other hand, since antitoxin A_2 was relatively low in antibody capable of giving floccules other than toxoid-antitoxin. Hence the value 0.0005 mgm. N per unit of antitoxin is more probably nearer the truth than the values 0.0007 or 0.0003. The value 0.0005 mgm. N per unit

antitoxin obtained with antitoxin A_2 agrees with that obtained with antitoxin B and toxoid 170.

If one assumes the value 0.0005 mgm. N per unit of antitoxin, then a probable value for toxoid is 0.0004 mgm. N per Lf.

SUMMARY

From the results of the analysis of tetanus toxoid-antitoxin floccules, there is derived the probable values of 0.0004 mgm. N per Lf for toxoid and 0.0005 mgm. N per unit for antitoxin.

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Epidémie de Fièvre Typhoïde Causée par la Consommation de Lait Cru*

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AL'AUTOMNE de 1940, la petite ville de Trois-Pistoles a été aux prises avec une épidémie de fièvre typhoïde dont elle se souviendra longtemps.

Situation géographique

Trois-Pistoles est située entre Rivière-du-Loup et Rimouski, sur la rive sud du St-Laurent. Place d'été fort achalandée par les touristes et les étrangers.

Population

2070 au début de l'épidémie. Durant la belle saison cependant, la population est un peu plus élevée dû au fait que des cours de français y sont donnés et suivis par une groupe d'environ quarante Ontariens. De plus, beaucoup de touristes pensionnent dans des maisons privées.

Organisation sanitaire

a) *Aqueduc municipal:* l'eau provient d'une source naturelle, bien protégée. Elle ne subit aucun pompage ni traitement quelconque préalablement à son emploi et a toujours été très bonne à l'analyse. Elle rejoint les consommateurs par gravité et toutes les familles, à quelques exceptions près, dans les limites de la ville, se prévalent de ce grand avantage.

b) *Egoûts municipaux:* en bon ordre et se déversent dans le fleuve, sans traitement.

c) *Lait:* 100% cru. Avant l'éclosion de l'épidémie, 4 principaux laitiers se partageaient la clientèle. Evidemment, il y avait bien de ces petits laitiers parasites dont la clientèle est plutôt restreinte, mais cependant, il ne fallait pas les considérer comme quantité négligeable en temps d'épidémie. La surveillance et le contrôle de la production du lait étaient exercés par l'Unité sanitaire: inspections des lieux et analyses du lait à intervalles réguliers.

La qualité du lait distribué à Trois-Pistoles avant l'épidémie, n'était pas inférieure à celle du lait distribué dans les autres municipalités rurales du district. De plus, le laitier en cause n'était pas celui qui produisait le lait le plus sale, au point de vue bactériologique.

d) *Réglementation municipale concernant la production et la vente du lait:* Aucune.

Il y a quelques années, les laitiers avaient bien demandé à la Commission de l'Industrie Laitière de fixer le prix du lait dans les limites de la ville de

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Trois-Pistoles; mais ce réglement ne fut maintenu en force que quelques mois, alors que les consommateurs firent disparaître ce règlement alléguant que le prix était trop élevé et qu'enfin de compte, ils avaient bien le droit de payer ce qu'ils voulaient pour une pinte de lait. Comme conséquence, certain laitier vendait son lait jusqu'à 0.05 la pinte.

ÉPIDÉMIOLOGIE

Aucun cas de maladies contagieuses ne nous avait été rapporté durant l'été et le commencement de l'automne 1940. En octobre et novembre, la grippe cependant, sévissait à l'état quasi épidémique, comme dans toutes les autres régions de la Province, d'ailleurs. Il est évident que cette notion d'épidémie de grippe a contribué à retarder toute action immédiate, comme nous le verrons plus loin.

L'alerte

Elle fut sonnée par un médecin praticien de l'endroit qui rapporte à l'Unité sanitaire quatre (4) cas de typhoïde probable dans la même maison. On était à la fin de novembre.

L'enquête préliminaire sur les lieux est faite. L'eau, pour le moment du moins, ne semble pas être en cause et les recherches s'orientent vers la possibilité d'une infection par le lait. Visite est faite chez le laitier de cette famille: trois (3) de ses enfants ont eu une grosse grippe au cours de septembre et d'octobre et un médecin a vu les malades.

L'existence de plusieurs cas de grippe dans la ville, a fait poser le diagnostic de *grippe trainante*. En présence de ce diagnostic émanant du médecin de famille, vous avouerez que la situation du médecin-hygièniste devenait délicate et embarrassante: d'abord, parce qu'il n'avait pas vu les malades dans le temps, et ensuite parce qu'il s'agissait d'un laitier. Inutile de dire que la famille du laitier n'était pas trop empressée de répondre à toutes les questions, et pour cause.

Je donne des conseils et leur enjoins l'ordre d'empêcher ceux qui avaient été malades, de manipuler le lait de quelque manière que ce soit et de veiller à une stérilisation plus soignée des bouteilles à lait et ustensiles, afin de parer à toute éventualité.

L'enquête est continuée quelques jours après chez plusieurs de ses clients et ne révèle aucun cas de typhoïde, ni ancien ni actuel, à part les 4 cas qui m'avaient été déclarés antérieurement dans la même famille, fin de novembre. Tout semblait donc absolument normal par ailleurs.

J'apprends sur les entrefaites, qu'un des fils de notre laitier, âgé de 16 ans, a été transporté à l'hôpital de Rivière-du-Loup depuis quelques jours. Ce grand garçon avait eu lui aussi la fameuse grippe au milieu de septembre. Mais, voilà que vers le milieu de novembre, une crise de douleur l'oblige à faire demander un autre médecin que celui qui l'avait vu pour sa grippe. Un diagnostic de calcul du rein est porté et le jeune homme s'embarque pour l'hôpital où ce diagnostic est confirmé par la clinique et par la radiographie.

L'existence de typhoïde est encore ignorée. Cependant, je m'arrange avec le médecin traitant à l'hôpital pour qu'un échantillon de sang soit expédié au laboratoire. Le résultat, après quelques jours d'attente, se lit comme suit: *Sérologie positive au bacille typhique.*

Nous étions au début de décembre et aucun nouveau cas ne nous avait été signalé par les médecins de l'endroit. Mais, à ce moment, l'existence de typhoïde étant connue, les déclarations commencèrent à arriver nombreuses à nos bureaux.

MESURES PRISES

1.—*Arrêt de la vente du lait.*

2.—*Collection de toutes les bouteilles*, le jour même, par le laitier en cause et lui appartenant, afin qu'aucune bouteille ne restât en circulation plus longtemps, évitant ainsi tout danger d'interchangement. Le laitier avait mission aussi d'avertir ses clients qu'il ne leur livrerait plus de lait jusqu'à nouvel ordre, leur procurant ainsi l'avantage de s'organiser avec un autre laitier.

3.—*Organisation des autres laitiers:*

I.—Ordre leur fut donné de faire bouillir toutes leurs bouteilles pendant une demi-heure, jusqu'à nouvel ordre. Ceux qui avaient à faire deux livraisons par jour, étaient obligés de répéter cette opération deux fois par jour.

II.—De redoubler de prudence et de soins dans la manipulation du lait.

III.—De s'informer à chacun de leurs clients s'il n'y avait pas de typhoïde dans la maison.

IV.—Dans l'affirmative et même dans un cas douteux ou suspect, ne pas reprendre les bouteilles provenant de tels foyers, mais de vider le lait directement dans un récipient devant rester dans la maison.

4.—*Organisation des Médecins locaux:* Coopération, déclaration précoce des cas et vaccination privée.

5.—*Conseils aux paroissiens* par l'entremise des Ministres du Culte et par des conférences publiques.

6.—*Organisation des entrepreneurs de pompes funèbres* au cas de décès.

7.—*Organisation des contracteurs* faisant chantier et embauchant des hommes pour le bois.

8.—*Vaccination de la population:* séances publiques. A ce sujet, voici quelques considérations:

a. 33% de la population fut vaccinée, soit 700 personnes, en deux injections (½ et 1 c.c.) à une semaine d'intervalle.

b. Réactions locales: Je ne vous apprendrai rien en vous disant que 100% ont réagi localement. Les enfants, cependant, ont plutôt montré des réactions bénignes tandis que les adultes ont eu à souffrir de leur bras pendant 36 ou 48 heures.

c. Réactions générales: Elles ne furent pas la règle. Cependant, nous avons constaté dans 5 ou 6 cas, une élévation thermique à 103° F., avec frissons, douleurs généralisées, courbature et lombalgie. Quelques-uns ont dû

garder le lit pendant 2 ou 3 jours. Nous avons constaté chez deux jeunes filles l'apparition, 10 à 12 heures après la deuxième injection, de nodules ayant le même aspect que l'érythème noueux. Ils siégeaient surtout sur les membres inférieurs, mais aussi sur région du coude. Douloureux au toucher, avec état sub-fébrile.

d. Aucune infection ne fut enregistrée.

e. Nous ne vaccinions pas, les femmes enceintes, les menstruées, les cardiaques, les T.B. avec lésion active, les néphrétiques, les hépatiques.

9.—*Dépistage des cas:* Il fallait surtout procéder à une enquête rétrospective pour découvrir les cas qui auraient pu survenir au cours d'octobre et novembre. Aussi, 5 cas dont la date de début remontait au mois d'octobre et 23 au mois de novembre, furent dépistés.

BILAN

I.—*Nombre de cas:* 68.

Primaires: 68. Tous ceux qui ont été malades ont bu du lait infecté provenant de la même source.

Secondaires: 0. Nous n'avons pu trouver de cas franchement secondaire.

Graves: 35, soit 51.5%.

Bénins: 33, soit 48.5%. Formes ambulantes incluses (8).

II.—*Mortalités:* 7, soit 10.3%.

Age de décédés: 14, 18, 19, 20, 23, 27 et 58 ans.

III.—

TABLEAU I

(Distribution des décès par causes et par âges).

TABLE I

(Distribution of deaths by causes and by ages).

Causes	Décès — Deaths	Ages
Perforation intestinale— (Intestinal perforation)	2	19, 27
Myocardite— (Myocarditis)	2	18, 20
Congestion pulmonaire— (Congestion of the lungs)	1	14
Infection du foie— (Liver infection)	1	23
Suppuration glandes salivaires— (Abscesses of the salivary glands)	1	58
Total	7	

IV.—*Familles atteintes:* Le laitier en cause fournissait le lait à 49 clients, comprenant 240 personnes, consommant 70 pintes de lait par jour. De ces 49 familles, 21 furent atteintes, soit 43%. De ces 240 personnes, 66 furent atteintes, soit 27.5%. Deux autres familles, tout en n'étant pas des clients, ont eu chacune un cas. Ces deux personnes sont allées boire du lait chez des parents ou chez un voisin.

TABLEAU II
Cas multiples dans les mêmes familles

TABLE II
Multiple cases in the same families

Nombre de familles — No. of families	Nombre de cas — No. of cases	Total des cas — Total cases	Nombre de morts — No. of deaths
1	9	9	0
1	8	8	3
1	6	6	0
1	5	5	1
3	4	12	1
4	3	12	1
4	2	8	1
8	1	8	0
Total: 23	..	68	7

Il est fait digne de mention, c'est qu'aucun cas de typhoïde n'est survenu dans la clientèle des autres laitiers. Ce qui prouve, dans mon humble opinion, que les recommandations données aux familles et aux laitiers, ont été scrupuleusement suivies.

Population des familles atteintes: 129.

Nombre de personnes atteintes: 68, soit 52.7%. Les décès se répartissent dans 5 familles. Trois décès chez le laitier.

V.— TABLEAU III
Distribution des cas selon le mois d'occurrence

TABLE III
Distribution of cases according to month of occurrence

Mois d'occurrence — Month of occurrence	Nombre de cas — No. of cases	%
Septembre—September	2	3.0
Octobre—October	5	7.5
Novembre—November	25	36.5
Décembre—December	32	47.0
Janvier—January	4	6.0
Total	68	100.0

VI.— TABLEAU IV
Distribution des cas par groupes d'âges

TABLE IV
Distribution of cases by age-groups

Groupes d'âges — Age-groups	Nombre de cas — No. of cases	% des cas — of cases
0 - 4	19	28.
5 - 9	12	17.5
10 - 19	17	25.
20 - 29	10	14.5
30 - 39	4	6.
40 - 49	3	4.5
50	3	4.5
Total	68	100.0

88% des cas en bas de 30 ans, soit 58.

Presque 50% des cas sont survenus dans le groupe d'âges de 0-9 ans, soit celui où l'on boit le plus de lait. Parmi les bébés, deux seulement de moins d'un an, ont été atteints.

Il faut dire aussi qu'au cours des cliniques de puériculture tenues mensuellement à Trois-Pistoles, nous avons insisté sur l'importance de faire bouillir le lait destiné aux bébés et ce, jusqu'au mois de décembre de chaque année. D'après enquête, nous pôuvons être certains que toutes les mamans, à quelques exceptions près, ont suivi ce conseil. Cette précaution a certainement contribué à mon avis, à empêcher qu'un plus grand nombre de bébés soient malades; les deux petits de moins d'un an buvaient du lait cru, sans ébullition préalable et ont été gravement malades. Les personnes qui ne prenaient du lait que dans leur thé ou café, n'ont pas été malades ou très peu.

VII.—*Analyses de laboratoire:* A date, nous avons prélevé environ 700 échantillons pour analyse.

VIII.—*Porteurs de germes:* Au 15 avril, tous les malades étaient négatifs (urine et fèces). Mais quelques-uns ont été positifs pendant un temps assez long, soit 4 mois. Au cours de l'été, des prélèvements seront faits chez tous ceux qui ont été malades, pour déterminer le nombre de ceux qui sont restés porteurs de germes.

RECOMMANDATIONS

1. Comme bien l'on pense, les autorités municipales m'ont demandé ce qu'il y avait à faire, afin d'éviter qu'un tel désastre ne se reproduise. J'ai répondu sans broncher et convaincu: la pasteurisation du lait, soit municipalisée, soit d'initiative privée.

La municipalité n'ayant pas les moyens d'organiser une usine, il ne fallait songer à une telle mesure de protection.

D'initiative privée: Il en a été fortement question, mais l'animosité régnant entre les laitiers a fait échouer le projet.

Réglementation municipale: Nous avons réussi à amener le Conseil de Ville à passer un règlement concernant la production et la distribution du lait dans les limites de la ville. Ce règlement va éliminer une foule de petits laitiers qui ne pourront rencontrer toutes les exigences formulées. De plus, la coopération entre les autorités municipales et sanitaires sera plus étroite qu'auparavant et sera de nature à exercer un contrôle plus efficace.

ORIGINE DE L'ÉPIDÉMIE

D'où l'infection est-elle partie? De la famille du laitier? D'un client? Ou d'une autre personne?

De la famille du laitier: Les trois premiers cas sont survenus dans cette famille. Il est évident que le lait s'yest contaminé avant de rejoindre les clients. Mais, où ont-ils pris la typhoïde eux-mêmes?

Théorie d'un porteur de germes: C'est possible, car la mère et le plus âgé

de ses enfants, ont eu la typhoïde il y a 30 ans. Cependant, des analyses répétées, après purgation avec de la caroide et des sels biliaires, ne nous ont pas permis de prouver cette possibilité. Nous n'avons pu établir que la mère ou le fils ait souffert d'un dérangement intestinal quelconque peu avant l'épidémie.

D'un client: Il aurait pu arriver qu'un cas de typhoïde survint chez un client et qu'ensuite l'infection fût transportée par l'intermédiaire des bouteilles à lait, chez le laitier. En effet, un cas bénin ambulant, aurait pu passer inaperçu et être l'origine de l'épidémie, mais encore là, nous n'avons pas de preuve à l'appui.

D'une autre personne: Après enquête, il ressort que deux citoyens de Ste-Françoise, à 8 milles de Trois-Pistoles, ont été malades de typhoïde, au cours de l'été 1940. Le premier tomba malade vers le 13 août. Du 13 au 20, il a été vu à plusieurs reprises à Trois-Pistoles; mais je n'ai jamais pu établir nettement quelles familles il a visitées. Lors de ses périgrinations dans Trois-Pistoles, il était excessivement malade. Aussi, est-il allé mourir dans un hôpital à Campbellton, le 31 août.

L'autre cas a comme date de début le commencement de septembre. Il vient consulter un médecin à Trois-Pistoles et s'y attarde quelque peu: a été vu dans les restaurants locaux. Il retourne chez lui à Ste-Françoise et tient le lit pendant 4 semaines. Ce dernier cas ne m'a été rapporté qu'à la fin de décembre.

Nous avons donc deux cas de typhoïde venant de l'extérieur et qui ont déambulé dans Trois-Pistoles quelques semaines avant l'éclosion de l'épidémie.

RÉSUMÉ

1. Le lait cru a causé 68 cas de typhoïde avec 7 morts, donnant un taux de mortalité de 10.3%.

2. Tous les cas sont survenus dans la clientèle du même laitier.

3. Cette clientèle comprenait 240 personnes, 27.5% furent atteintes. Population des familles atteintes: 129. 68 personnes furent malades, soit 52.7%.

CONCLUSION

Le lait cru expose à de graves dangers. La pasteurisation est encore le moyen le plus sûr de protection.

An Outbreak of Typhoid Fever Due to Raw Milk*

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IN the autumn of 1940, the little town of Trois Pistoles experienced an epidemic of typhoid fever which it will remember for a long time. Trois Pistoles is located on the south shore of the St. Lawrence river, thirty miles from Rivière-du-Loup. It is a well-known summer resort. At the onset of the outbreak the population was 2,070. During the summer season, however, the population is somewhat increased, due to the fact that a group of about fifty people from Ontario come every year to take a course in French. In addition, there are many tourists who board in private homes.

Sanitary Organization

Water Supply. The municipal water supply comes from a natural and well-protected spring. No pumping or treatment of any kind is required and on analysis the water has always been found to be very good. Practically the entire population uses the municipal supply.

Sewage Disposal. The municipal sewerage system is in good condition. Raw sewage is emptied directly into the St. Lawrence river.

Milk Supply. The milk supply is 100 per cent raw. Before the outbreak, four principal dairies supplied practically all the milk, but, as generally happens, there were other small sources of supply. This fact had to be taken into consideration in dealing with the epidemic. The sanitary conditions of production and distribution of milk were under the supervision of Health Unit officers. Inspection of the premises and analysis of milk samples were made at regular intervals.

It is to be noted that, as far as the quality of the milk is concerned, the local dairymen had as good records as those in any other rural municipality of the district.

There were no municipal by-laws regulating the production and sale of milk. Two years ago, the local dairymen asked the Provincial Milk Commission to set the price of milk within the town limits at 8 cents a quart. In response to this request, the municipal authorities passed a by-law, but unhappily this protective measure was repealed two months later following complaints from milk consumers who alleged that, after all, it was their right to pay what they wanted for a quart of milk. The result was that a certain dairyman was selling his milk for as little as 5 cents a quart.

*Presented before the Section of Epidemiology and Vital Statistics at the thirtieth annual meeting of the Canadian Public Health Association held in the City of Quebec June 9-11, 1941.

Epidemiology

During the summer and the beginning of autumn, all seemed to be quiet at Trois Pistoles and in the vicinity, as far as contagious diseases were concerned. In fact, not a single case of any communicable disease had been reported to the office, with the single exception of tuberculosis. It should be remembered, however, that "la grippe" was raging during October and November and the same condition prevailed all over the Province at that time. It is obvious that the general knowledge of the epidemic of grippe largely contributed to delay immediate action in dealing with the early diagnosis of typhoid, as we shall see later.

The alarm was sounded at the end of November by a local practitioner who reported four probable cases of typhoid fever in the same home.

A preliminary investigation was immediately conducted. Water, for the moment at least, did not seem to be the cause, and attention was focussed on the possibility of a milk-borne infection. A visit was paid to the dairyman who furnished milk to the family and it was learned that three members of this dairyman's own family, two sons and a daughter, had been very sick with "grippe" during September and October and had been attended by the family physician. The prevalence of many cases of grippe in the town had led the doctor to diagnose the illness as a form of grippe. In the presence of such a diagnosis coming from the family doctor, you will agree that the situation was a very embarrassing one for the medical officer of health, and for these two main reasons: he had not seen the patients during their illness and he had to deal with a dairyman who was not at all anxious to answer questions. Those who had been sick were instructed not to handle milk in any way. They promised also to pay more attention to the sterilization of the bottles and utensils in order to avoid further contamination should the illness prove really to have been typhoid fever.

The investigation was continued a few days later at the homes of several customers of the same dairyman, but it did not reveal any cases of typhoid, past or present, except the four cases which had been reported at the end of November.

In the meantime, it was learned that a son of the dairyman, aged 16, had recently been hospitalized at Rivière-du-Loup. This lad was one of those who had suffered from "grippe" in the middle of September and he had not recovered very quickly. In the middle of November he had had a violent pain in his back and had called another doctor, instead of the one who had attended him at the onset of his attack of grippe. A diagnosis of renal calculus was made and hospitalization was immediately recommended. The attending physician at the hospital confirmed the diagnosis by X-ray examination. Typhoid fever itself was not yet suspected, but we arranged with the attending physician to have a blood sample sent to the laboratory for analysis. The report, a few days later, gave positive findings for infection with *B. typhosus*.

Perhaps it is worth while mentioning that, although it was then the beginning of December, no further new cases had been reported by local physicians;

but from the very moment that the existence of typhoid fever became known, notifications began to reach our office in large numbers.

MEASURES TAKEN

1. The sale of milk by the above-mentioned dairyman was strictly forbidden.

2. The dairyman was instructed to collect immediately all bottles belonging to him, in order to remove from circulation all such suspicious bottles and to prevent possible interchange. He had strict orders to tell his customers that he had been stopped from selling milk for an indefinite period of time, so that they might make other arrangements.

3. The co-operation of other dairies was sought. They were asked to sterilize their bottles by boiling them for half an hour (those who had two deliveries a day were obliged to repeat the operation twice a day), to use greater care in the handling of milk, and to enquire from their customers whether there was a typhoid patient in the house.

4. The close co-operation of the local practitioners, in the early reporting of cases and the private vaccination of contacts, was enlisted.

5. Advice was given to the population through the parish priests and public meetings.

6. Special arrangements were made with undertakers.

7. The co-operation of lumber jobbers hiring men for the woods was obtained.

8. Vaccination was offered the population. Public meetings were held at the City Hall and 33 per cent of the population were vaccinated (that is to say, 700). Two injections ($\frac{1}{2}$ and 1 cc.) were given, with an interval of one week. You will not be surprised to know that 100 per cent had local reactions. The youngsters showed rather mild reactions while adults had very sore arms for a period of from thirty-six to forty-eight hours. General reactions did not occur as a rule. In five or six cases the following symptoms appeared: temperature 103° F. with cold chills, exhaustion, and lumbago. Some were confined to bed for two or three days. Two young girls among these cases responded quite curiously to the vaccine within ten to twelve hours after the second injection. Bluish nodules resembling erythema nodosum appeared on the legs and thighs and also in the region of the elbow. These nodules were painful to the touch. There was no fever present.

Vaccination was not given in the following cases in which it was contra-indicated: pregnancy, menstruation, heart trouble, tuberculosis with an active lesion, nephritis, and hepatic insufficiency.

9. An investigation had to be made in order to find the cases which might have occurred during October and November. As a result of this difficult study, 5 cases were found to have occurred in October and 25 in November.

CONSEQUENCES OF THE EPIDEMIC

There were 68 cases of typhoid fever. All were primary; not one real

secondary case was found. All those who contracted the disease drank milk which came from the same source. Thirty-five (51.5 per cent) were severe cases and 33 (48.5 per cent) were mild; in the latter number are included 8 ambulant forms. There were 7 deaths, giving a fatality rate of 10.3 per cent.

Table I (page 164) presents the distribution of deaths by cause and age.

Number of Families Attacked. The dairyman responsible for the outbreak was selling 70 quarts of milk a day to 49 families comprising 240 persons. Of these 49 families, 21 contracted typhoid fever. Two other families, although not customers of the dairyman, had one case each; they had used infected milk at the home of relatives or neighbours.

The occurrence of multiple cases in the same families is shown in table II (page 165).

It is worth mentioning that not a single case of typhoid occurred among the customers of the other dairymen. This proves, in my opinion, that all the recommendations given to the families and to the dairymen were scrupulously followed.

The number of persons in the families attacked was 129, and of this number 68 developed typhoid fever, i.e., 52.7 per cent. The seven deaths were distributed among five families, with three deaths in the milkman's own family.

Table III (page 165) gives the distribution of the cases according to the month of occurrence, and table IV (page 165) the distribution by age groups. Eighty-eight per cent of the cases were in the age group 0 to 29 years. The age group 0-4 years accounted for 28 per cent of the cases and the group 0-9 years for nearly 50 per cent. This period of life is the one during which the consumption of milk is greatest.

Among infants (under one year), only two had the disease. This low incidence is attributed to the fact that at our monthly well-baby clinics held at Trois Pistoles, special advice has always been given to the mothers concerning the importance of boiling milk given to babies, a precaution which was to be observed throughout the year. Information gathered proved that the great majority of the mothers had followed the advice given at the clinic. The boiling of the milk certainly contributed, in my opinion, to preventing a greater number of cases among babies fed exclusively on milk. The two cases under one year of age were fed raw milk which received no heat treatment at all, and as a consequence these babies were seriously ill.

Another point is worthy of mention: those who took milk only in tea or coffee either did not get typhoid or, if they did, the attack was of a very mild nature.

Laboratory Analyses. To the end of April, about 700 samples were sent to the laboratory for analysis.

Carriers. By the 15th of April, all the typhoid patients had become negative (urine and stools), although a few had been positive for quite a long time—as long as four months. In the course of the coming summer, samples

will be collected from all those who have been sick, in order to determine the proportion who are to be considered typhoid carriers.

RECOMMENDATIONS

As may be imagined, the municipal authorities earnestly asked us to tell them what it it would be necessary to do in order to avoid any repetition of such a disaster. I answered them without hesitation: Pasteurize all the milk, either through a municipal or a privately owned plant.

The municipality could not finance a pasteurization plant, so this method of protection was not considered. The provision of pasteurization through a privately owned plant was much discussed but this proposal failed because of the lack of agreement among the dairymen themselves.

Municipal Legislation. We succeeded in persuading the Town Council to pass a by-law regulating the production and sale of milk within the limits of the town. This by-law will eliminate a group of small dairymen who are unable to comply with all the conditions required. Moreover, the co-operation between the authorities, both municipal and sanitary, will be closer than it was before and will be of a kind to effect more efficient control.

ORIGIN OF THE EPIDEMIC

What was the source of the infection? Was it the dairyman's family? Or a customer? Or some other person?

The first three cases were in the dairyman's family. It is evident that the milk was contaminated there before it reached the consumers. But where did they themselves contract typhoid fever? One answer would be: from a carrier. This is possible because the mother and her eldest son had had typhoid fever thirty years ago. Still, repeated analysis after purgation with caroid and bile salts did not support this possibility. Moreover, it was not established that the mother or the eldest son had suffered from any intestinal trouble shortly before the epidemic.

A case of typhoid fever may have occurred at the home of a customer and, following this, the infection may have been carried, by the milk bottles, to the dairyman's home. In fact, a mild ambulant typhoid case may have passed unnoticed and have been the source of the epidemic. But again, there is no proof to support this contention.

After investigation, it appeared that two citizens of Ste. Françoise, eight miles from Trois Pistoles, were ill with typhoid fever during the summer of 1940. The first fell sick about the 13th of August. From the 13th to the 20th he was seen on several occasions at Trois Pistoles, but it was never definitely established which families he had visited. At the time of his peregrinations in Trois Pistoles he was excessively ill; so ill, in fact, that he was obliged to enter hospital at Campbellton, where he died on the 31st of August.

The other case dates back to the beginning of September. He came to consult a doctor at Trois Pistoles and remained there for a short time. He was

seen in the local restaurants. He returned home to Ste. Françoise and kept to bed for a month. This case was reported to me only at the end of September.

We have therefore two cases of typhoid fever coming from outside Trois Pistoles and remaining in the town for a few weeks before the outbreak of the epidemic.

SUMMARY

1. Raw milk was the cause of 68 cases of typhoid fever, with 7 deaths—a fatality rate of 10.3 per cent.
2. All these cases were among the customers of the same milkman.
3. These families numbered 240 persons and 27.5 per cent were attacked. The total number of persons in the families attacked was 129. Of this number 68 (52.7 per cent) were ill.

CONCLUSION

Consumers of raw milk are exposed to very serious dangers. Properly pasteurized milk is always the safest milk.

Diagnosis of Enterobiasis

(Evaluation of Recent Devices)

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THE experience of the past three years in the conduct of surveys has shown that there is, in general, a lack of knowledge regarding both the methods of examining for, and collecting of, material for the laboratory examination of pinworm infection. The present summary has been prepared to describe the most recent and efficient methods of diagnosis.

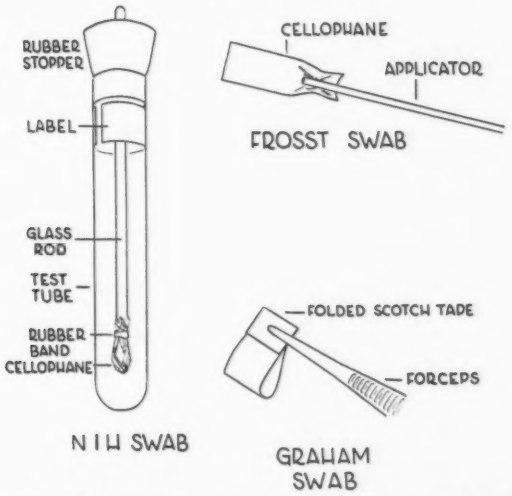
It is well recognized that, because of the unique life cycle of the parasite, the usual methods of examination of stool are unreliable. The female pinworms do not discharge the eggs in the intestine but migrate to the perianal regions and deposit the eggs on the skin outside the anus. Eggs are rarely found, therefore, in the stool, although female parasites will be seen in it at times, and in this way a relatively small number of cases come to the attention of physicians. The results obtained by various workers have shown that about 5 to 10 per cent of infected cases can be disclosed by finding the female parasites in the amount of stool as usually supplied for the routine examination. Attempts to diagnose pinworm infection by obtaining the eggs from the perianal regions date back over sixty years. Various swabs and scrapers have been designed and used, though none has come into general use. Hall (1), after extensive tests with various kinds of swabs and scrapers, devised the NIH (National Institute of Health) swab, which is used at present in the United States, Canada, and probably elsewhere. This swab was designed to meet the following specifications: "It should pick up pinworm eggs, when these are present, quite dependably; should deliver them to a microscope slide dependably with the minimum amount of manipulation that involves dilution or possible loss of eggs from any cause; should be easy to transport with no loss of eggs and with safety to persons handling the swabs; and should cause the patient little or no inconvenience in its use."

DESCRIPTION OF SWABS

NIH Swab

The swab consists of a glass rod with smoothly rounded ends, 4 mm. in diameter and about 10 cm. long. This is inserted into a perforated No. 0 rubber stopper and fitted into a test tube. The lower end of the rod is tipped with a one-inch-square No. 450 moisture-proof transparent Cellophane which is held in place by a rubber band. The rubber bands, about 2 mm. wide, are cut from medicinal tubing with a bore of about 2.5 to 3 mm. The Cellophane-covered tip of the rod is stroked firmly, with an outward motion, over the perianal folds and across the small opening. The folds of the Cellophane provide a proper amount of firm friction on the skin, and the eggs, when

present, adhere to the Cellophane. The swab, following its use, is placed in the test tube which prevents loss or dissemination of the eggs. Enclosed in a container the swabs can be readily sent through the mail and the examina-



SKETCHES OF RECENT DEVICES DESIGNED FOR COLLECTING MATERIAL FOR THE EXAMINATION OF PINWORM INFECTION.

tion of the swabs can be made after several days or weeks. This is done by slipping the rubber band up the rod with a pair of forceps, removing the Cellophane square, and mounting it on a slide in a drop of water or decinormal sodium hydroxide. A cover slip is applied, gently pressed to smooth the folds of the Cellophane, and examined under low power. The outfit is then sterilized, following which it is tipped with new Cellophane. It can, therefore, be used repeatedly. At least five, and preferably seven, swabs should be taken, on five or seven different mornings, before the absence of pinworms can be confirmed.

Graham's Swab

Graham (2) described a device which consists of a piece of "Scotch Cellulose Tape" 1 cm. wide and about 8 cm. long. This is folded back for about 1 cm. at each end towards the adhesive side, to form a non-adhesive, firm grip for handling. The adhesive surface is intended to pick up any eggs present. The tape is held with forceps in a loop, with the adhesive surface on the outer side, and is patted down on the perianal skin. The tape is then placed, adhesive side down, on a microscope slide, smoothed down with the side of the forceps, and examined microscopically.

Frosst Swab

This swab has been distributed recently to physicians by Charles E. Frosst & Company in Montreal. It consists of a piece of Cellophane 1 inch long and $\frac{1}{2}$ inch wide, glued to the end of an applicator. The instructions

for its use are given as follows: (*1*) The patient is examined in the morning before bathing. (*2*) The anal and perianal region is stroked with the Cellophane swab. (*3*) Place a drop of water on a microscope slide, lay the Cellophane which has been in contact with the tissue on a drop of water, and with sharp scissors cut off about ½ inch of Cellophane. (*4*) Cover with cover slip and examine under high power.

EVALUATION OF SWABS

Swabbing is unlikely to be practised to any extent in the doctor's office. It remains the task of mothers in homes and of nurses in hospitals to swab the children in the mornings, immediately they have risen, and before bathing or using the toilet. The swab, therefore, must be (*1*) ready for use, (*2*) simple to handle, (*3*) efficient, (*4*) safe for the person who performs the swabbing, (*5*) safe to keep in a home until all swabs have been taken, and (*6*) convenient for transportation.

The NIH swab, which is a swab-scraper, is the most efficient in picking up the eggs which may be attached to the skin or enclosed in the folds of skin. It is simple and can be safely given to mothers to swab their children or themselves. It protects the eggs from being disseminated in the household and it can be transported conveniently from place to place. The swab has been used extensively by the School of Hygiene, University of Toronto, for surveys and experimental work. Sets of five or seven swabs, with instructions included, have been given to physicians who have distributed them to their patients. In no case have the doctors performed the swabbing. We have found that mothers, with few exceptions, have followed the instructions and carried out the swabbing efficiently.

The Graham swab lacks the firmness of the NIH swab and is inefficient in picking up the eggs, especially if only a few are present. It is unpleasant to the patient as during swabbing the glue from the tape sticks to the patient's skin. It has the advantage that once it is glued on the slide it can be safely kept and transported. It is not suitable for use in the home, as microscope slides, Scotch tape and a pair of forceps are required. Moreover, some mothers may not be efficient in preparing the swab or mounting it on the slide.

In our experience the Frosst swab is unsatisfactory. The Cellophane easily drops off the applicator before, during, or after swabbing. In the latter case, it may come into contact with bedding or the patient's clothing or with the hands of the person who takes the swabs. There is no way of safely handling the swab in a home. It cannot be transported to the laboratory without danger of losing material from the swab or spreading the infection among those who handle the swabs.

We, therefore, recommend the NIH swab as being the most efficient and convenient means of collecting material for the examination of pinworm infection.

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1. Hall, M. C.: Studies on Oxyuriasis. I. Types of Anal Swabs and Scrapers, with a Description of an Improved Type of Swab. Am. J. Trop. Med., 1937, **17**: 445.
2. Graham, C. F.: A Device for the Diagnosis of Enterobius Infection. Ibid., 1941, **21**: 159.

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AWARDS IN THE 1941 CANADIAN HEALTH CONSERVATION CONTESTS

THE names of the cities and counties receiving awards in the 1941 Canadian Health Conservation Contests, conducted by the Canadian Public Health Association in cooperation with the American Public Health Association, were announced on April 16th by the Contest Grading Committee, of which Dr. W. S. Rankin, of the Duke Endowment Fund, Charlotte, North Carolina, is chairman. The following cities and counties were selected for the 1941 National Health Honour Roll. They are listed alphabetically.

THE CITY CONTEST:

Group 1: Cities over 100,000 population with full-time services
Hamilton, Ontario
Windsor, Ontario

Group 2: Cities under 100,000 with a full-time medical officer
No award

Group 3: Cities under 100,000 with a part-time medical officer
St. Catharines, Ontario

THE RURAL CONTEST:

Western Division: Red Deer Health Unit, Red Deer, Alberta

Eastern Division: Arthabaska County Health Unit, Quebec
Nicolet County Health Unit, Quebec
Shefford County Health Unit, Quebec
St. Hyacinthe-Rouville Health Unit, Quebec
St. Jean-Iberville-Laprairie-Napierville Health Unit, Quebec

Plaques will be presented to the medical officers of health of these cities and counties at a dinner on Monday, June 1st, during the thirty-first annual meeting of the Canadian Public Health Association, which will be held in Toronto June 1st to 3rd.

In addition to the major awards, the Grading Committee has recommended that letters of commendation for public health improvement be sent to the cities of Vancouver, B.C., Lachine, Que., and Montreal, Que.

This is the fifth year that the Canadian Rural Health Conservation Contest has been held and the second year in which there has been a contest for cities. Both contests are conducted by the Canadian Public Health Association in co-operation with the American Public Health Association. Financial support for the Rural Contest is provided by the W. K. Kellogg Foundation of Battle Creek, Michigan; and for the City Contest, by the Metropolitan Life Insurance Company.

It is hoped that the participants have found in these contests an effective means of focusing public attention upon the accomplishments and defects of their local health services and upon the need for maintaining effective health protection at all times. In this year's contests, special emphasis has been placed upon the need for continual vigilance in the protection of public water supplies, for the more widespread pasteurization of milk, and for greater efforts to protect the population from those diseases for which protective measures are available.

To the American Public Health Association, the W. K. Kellogg Foundation, and the Metropolitan Life Insurance Company, the Canadian Public Health Association again expresses its appreciation of their co-operation in making the Canadian contests possible; and to the medical officers of the participating cities and counties, its appreciation of their interest in this effort to assist in developing sound public health work.

HEALTH TRAINING IN SCHOOLS

CANADIANS were shocked to read last November a statement made in the House of Commons by the Hon. Mr. Thorsen that, of the young men called up for military training, 43 per cent had been rejected because of lack of physical fitness. War teaches valuable lessons but it should not be necessary to have a war to make people realize that the health and physical fitness of children and of young people are of paramount importance to the country.

Each province of Canada has a government-supported system of education. The past fifty years have seen a marked broadening of the concept of education. Fundamentally education should consist in training people to think, while simultaneously supplying them with sufficient knowledge to enable them to benefit from past experience. It is vitally important that children become useful citizens; for this, training in healthful living is essential. Habits formed in childhood generally persist throughout life. Surely it is important that children become habituated in living from day to day so that they may be as healthy as possible.

Under ordinary circumstances teachers are not expected to teach a subject in which they have not had proper training. A specialist in languages is not likely to do justice to mathematics. Health training should not be regarded as a side-line which can be undertaken by any person into whose hands a manual on the subject has been placed. Pedagogical education should include, as an essential subject, the training of teachers to form health habits, themselves, and to impart such information to their students. Two difficulties are frequently

encountered. It is said that curricula, both of schools and of teacher-training institutions, are now so crowded that nothing more could be added; perhaps less essential subjects could be subtracted. The other difficulty is that physical education is still confused, in the minds of many persons, with health training. Teaching children to play games is considerably different from training them to want to live in health.

At present there is a widespread enthusiasm for nutrition. No one would decry that for a moment, but it is advisable to temper the enthusiasm by pointing out that nutrition is not the only factor which controls health. Many other influences operate and some of these are as important as diet. In fact, the state of nutrition can be impaired by factors which are not dependent upon the food intake. There is no necessity to have nutrition taught as a separate subject in schools, even in a course which should be designed to encourage girls to become home-makers and which is so unattractively named as household science. On the other hand, nutrition should not be neglected in the schools. It should be an essential part of the training in living for health. While the carrying out of this training would not be as spectacular as some current efforts in nutrition, the results would be much more enduring. Adequate training in the rules of health, including proper emphasis upon nutrition, intelligently given in all the schools of Canada, would have a profound effect in the prevention of malnutrition.

Canadian Public Health Association

Ontario Health Officers Association

Annual Meetings, Toronto, June 1-3

TODAY, as never before, attention is centered on clearly defined objectives in every field of national endeavour. The program committee for the thirty-first annual meeting of the Canadian Public Health Association and the twenty-eighth annual conference of the Ontario Health Officers Association realizes that everyone working in the field of public health is today fully occupied with the daily tasks. Yet public health is not static. Health officers realize that three days spent in hearing from those who are carrying forward new programs and developing new methods is of tremendous assistance in advancing their own work. Having in mind the urgency of the time, the program committee are presenting the problems of first importance to every health officer. The program which has been prepared is, in the opinion of the committee, eminently practical, and has been designed to meet the needs of the medical officer of health and the members of his staff. Public health nurses will find that their interests have been considered, and those engaged in sanitary inspection will find programs that will meet their needs.

There will be three general sessions, occupying Monday, Tuesday and Wednesday afternoons, and three sessions of the Ontario Health Officers Association, as well as Section meetings in epidemiology and vital statistics, public health nursing, public health education, and industrial hygiene.

Two sessions of the Ontario Health Officers Association will take the form of open discussions of subjects relating to immunization and other matters of concern to health departments, briefly introduced. The freely expressed opinions of many health officers often do more to supply

pertinent information and to clarify issues than does a series of formal papers. These guided discussions have been found most helpful and will be a feature of this year's meeting.

The extent of public health undertakings in Canada today is reflected in the Section meetings. Three sessions in epidemiology and vital statistics are planned. Outlines of epidemics that have been studied during the past year in various parts of Canada—including such important outbreaks as those of poliomyelitis and equine encephalomyelitis in Western Canada—will be presented by those who have first-hand knowledge of these outbreaks. Few fields are more interesting and profitable to health officers than epidemiology and it is signicant that the papers in these three sessions are being presented by representatives of the health departments of five provinces. A welcome addition to this year's program is a Section meeting in public health education. This session will provide first-hand information for health officers concerning the utilization of local resources and practical measures which may be taken in any community. The combined meeting of the Sections of Public Health Nursing and Industrial Hygiene will provide an opportunity of discussing problems common to both fields, including the provision of medical and nursing care for industrial workers, and nutrition in relation to industry.

The meetings in Toronto this year will permit members of the Ontario Branch of the Canadian Institute of Sanitary Inspectors to attend the general sessions as well as to hold sessions for the discussion of their problems.

DIRECTORY OF SESSIONS

MONDAY, JUNE 1

MORNING—Section Meetings, Canadian Public Health Association:

Epidemiology and Vital Statistics.

Public Health Nursing.

Ontario Health Officers Association:

Review of recent legislation.

Canadian Institute of Sanitary Inspectors.

AFTERNOON—General session, all associations:

Public health in wartime, the immunization program of the R.C.A.F., the epidemiology of venereal disease, mental health in wartime, health services in the secondary school.

EVENING—Annual dinner, all associations:

Speaker: Dr. John L. Rice, Commissioner of Health for New York City.

Presentation of awards in the 1941 Canadian Health Conservation Contests.

TUESDAY, JUNE 2

MORNING—Ontario Health Officers Association:

Guided discussions on local health administration.

Sections of Public Health Nursing and Industrial Hygiene, Canadian Public Health Association:

Nutrition and industry, provision of medical and nursing care in industry.

Section of Epidemiology and Vital Statistics:

Problems in vital statistics.

AFTERNOON—General session, all associations:

A nutritional program for Canada in wartime, vitamin therapy, health matters in national defence areas, the medical officer and A.R.P., influenza.

EVENING—Executive Council, Canadian Public Health Association.

WEDNESDAY, JUNE 3

MORNING—Ontario Health Officers Association and Section of Epidemiology and Vital Statistics, Canadian Public Health Association:

Tuberculin testing, reinforcing dose of diphtheria toxoid, scarlet fever immunization, typhoid fever epidemics, full-time health services in Canada.

Section of Public Health Education:

Public interest in health, tools and programs in health education, educational techniques for nutrition, printed matter in health education, utilizing service clubs and other local organizations, experiments in health education.

Canadian Institute of Sanitary Inspectors.

LUNCHEON—Canadian Public Health Association and Ontario Health Officers Association.

AFTERNOON—General session, both associations:

Poliomyelitis—control and treatment, sources and modes of infection.

Encephalitis—nature of the infection, clinical and epidemiological findings in the outbreak in Western Canada in 1941.

CURRENT HEALTH LITERATURE

State Diphtheria Immunization Requirements

LEGAL provisions relating to diphtheria immunization exist in the form of statutes in five states and in Alaska, and in four states as regulations of the state departments of health. On the one extreme is North Dakota, where it is forbidden to make vaccination or inoculation a condition precedent for the enjoyment of any privilege. On the other hand, general immunization of children is required in North Carolina. Regulations in the remainder vary; in one case immunization is required as a prerequisite to school attendance; in another non-immunized children may be excluded from school if deemed necessary; in still another, local boards of health are authorized to administer toxoid if it appears necessary for the prevention of an epidemic. In general exemption is allowed where religious principles are involved.

Wiliam Fowler, U.S. Pub. Health Rep., 1942, *57*:325.

Search for Carriers in an Outbreak of Acute Anterior Poliomyelitis in a Rural Community

THIS paper reports the laboratory investigation of a small outbreak of poliomyelitis occurring in New York State in September 1940. Stool specimens were obtained from 5 paralytic cases; members of their families; members of a family who had had intimate contact during the incubation period with one of the paralytic cases; members of a family where no definite contact was established; four individuals who had had poliomyelitis previously. Stools were treated with lauryl sulphate and ether prior to intraperitoneal inoculation of monkeys.

In all, specimens from 40 individuals were examined and the presence of poliomyelitis virus was considered established only when monkeys developed typical paralysis. On this basis, virus was definitely recovered from 4 of the 5 cases and suggestive evidence was obtained in the fifth case. Of 27 contacts, virus was present in the stools of 20, with ages ranging from ten months to forty-three years. Virus was not present in the stools of 4 members of a family where contact was lacking and not present in the stools of 4 individuals who had had poliomyelitis years previously though one of these had had contact with one of the patients.

George Y. McClure and Alexander D. Langmuir, Am. J. Hyg., 1942, *35*:285.

The Use of Sulfaguanidine in the Treatment of Dysentery Carriers

ELEVEN individuals from whose stools dysentery bacilli were repeatedly isolated were treated with sulfaguanidine over a period of from two to six days, the total amount of drug varying from 16 to 84 gm. In 9 of the 11 persons, 10 of whom were regarded as healthy carriers, dysentery bacilli disappeared during the period of drug administration. Stool cultures were repeated at intervals up to three months and in no case was a return of the organism noted. In 2 cases the bacilli were still present after three courses of treatment. A few toxic reactions occurred but all patients remained ambulatory and continued work while being treated.

It is suggested that sulfaguanidine may become a useful weapon in the control of the spread of bacillary dysentery both in civil life and among the armed forces. While this study concerns a very small series of cases, it serves to confirm previous reports.

Lowell A. Rantz and William M. M. Kirby, J.A.M.A., 1942, *118*:1268.

The Dangers of a National Salaried Medical Service

THIS is a thought-provoking article on the future of the medical profession. That changes have taken place and are about to take place cannot be denied. These have been and will continue to be largely a result of pressure from

outside the ranks of the profession. Reorganization presents itself in two chief forms: (a) the insurance principle with payment of doctors by capitation fee and (b) payment by salaries from a central controlling authority.

These two schemes are analyzed and compared and drawbacks noted. The difficulties in achieving a workable scheme which will not "sterilize and stultify the independent professional spirit which must be the life force of any medical service, private or national" appear very real. In addition to a plea to medical bodies to take cognizance of the trend many danger points are discussed and timely suggestions made.

A. E. Brown, Med. J. Australia, 1942, Jan. 17, p. 74.

Healthy Hearts for the Middle Aged

THE author explains in very simple language some of the reasons for "heart trouble" in the middle aged and lists eight rules for conserving cardiac energy. In general terms these suggestions relate to a balanced plan of living, including at least fifty hours of sleep a week, adequate leisure periods, and avoidance of recreational pursuits which produce distress of any kind. Exercise is regarded as important but should be carefully adjusted to individual capacity. Studied tranquillity in carrying out one's activities and cultivation of the art of complete muscular relaxation should do much towards avoiding general and cardiac fatigue. Certain dietary regulations must be considered, such as moderate size of meals, unhurried eating, avoidance of excess caffein, alcohol, tobacco, fats and sweets.

In general this advice simmers down to the adoption of a philosophy of life based on moderation and equanimity which need not entail any sacrifice of achievement.

O. P. J. Falk, Hygeia, 1942, *20*:90.

Reduction of Industrial Absenteeism by Preseasonal Immunization Against Catarrhal Illness

A DESIRE to reduce the loss in time and consequently in essential war production due to catarrhal conditions provided the incentive for this study. The immunizing agent might be described as a "mass autogenous vaccine" in that a great variety of local strains was obtained and incorporated in the finished vaccine along with microorganisms from other sources. A polyvalent product was thus assured. The vaccinated group consisted of 950 workers in a factory employing approximately 1800, the remainder of whom served as controls.

Careful recording of all significant data for the two groups indicated that there was no reduction in incidence of colds and influenza in the inoculated group but that there was a marked reduction in severity of attacks. This was borne out by the fact that absenteeism due to catarrhal illness in the inoculated group compared with the uninoculated group showed a reduction of 34.1 per cent in the number of days lost. Since the vaccinated group included those who were most susceptible to colds this result was regarded as highly significant.

M. R. Brady, Am. J. Med. Sciences, 1942, *203*: 469.

The Development of Public Health in Canada

A review of the history and organization of public health in Canada.

Edited by

R. D. DEFRIES, M.D., D.P.H.

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